FIG. 1

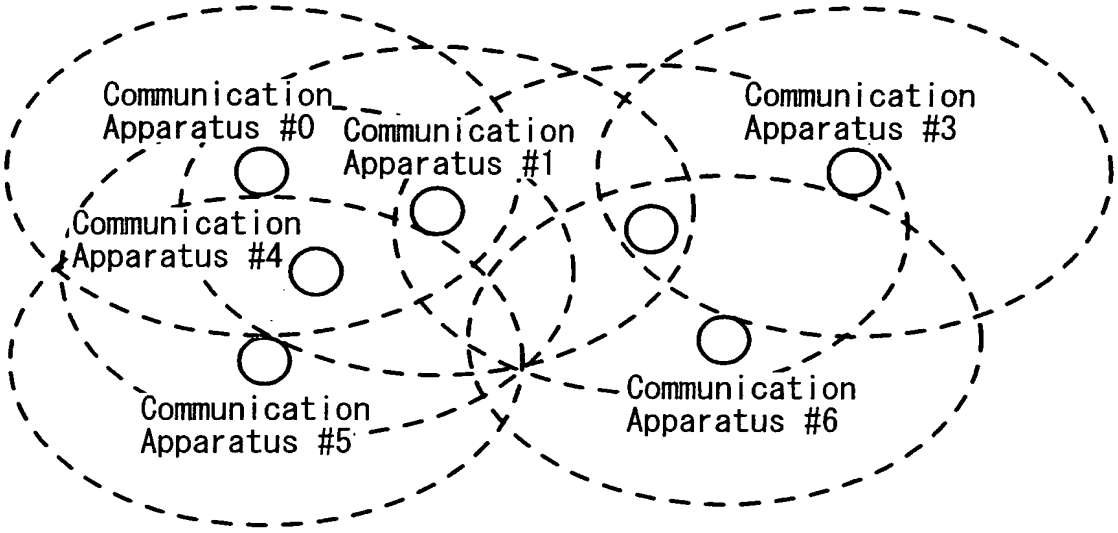

Communication Apparatus #0
Communication Apparatus #1
Communication Apparatus #3
Communication Apparatus #4
Communication Apparatus #5
Communication Apparatus #6

FIG. 2

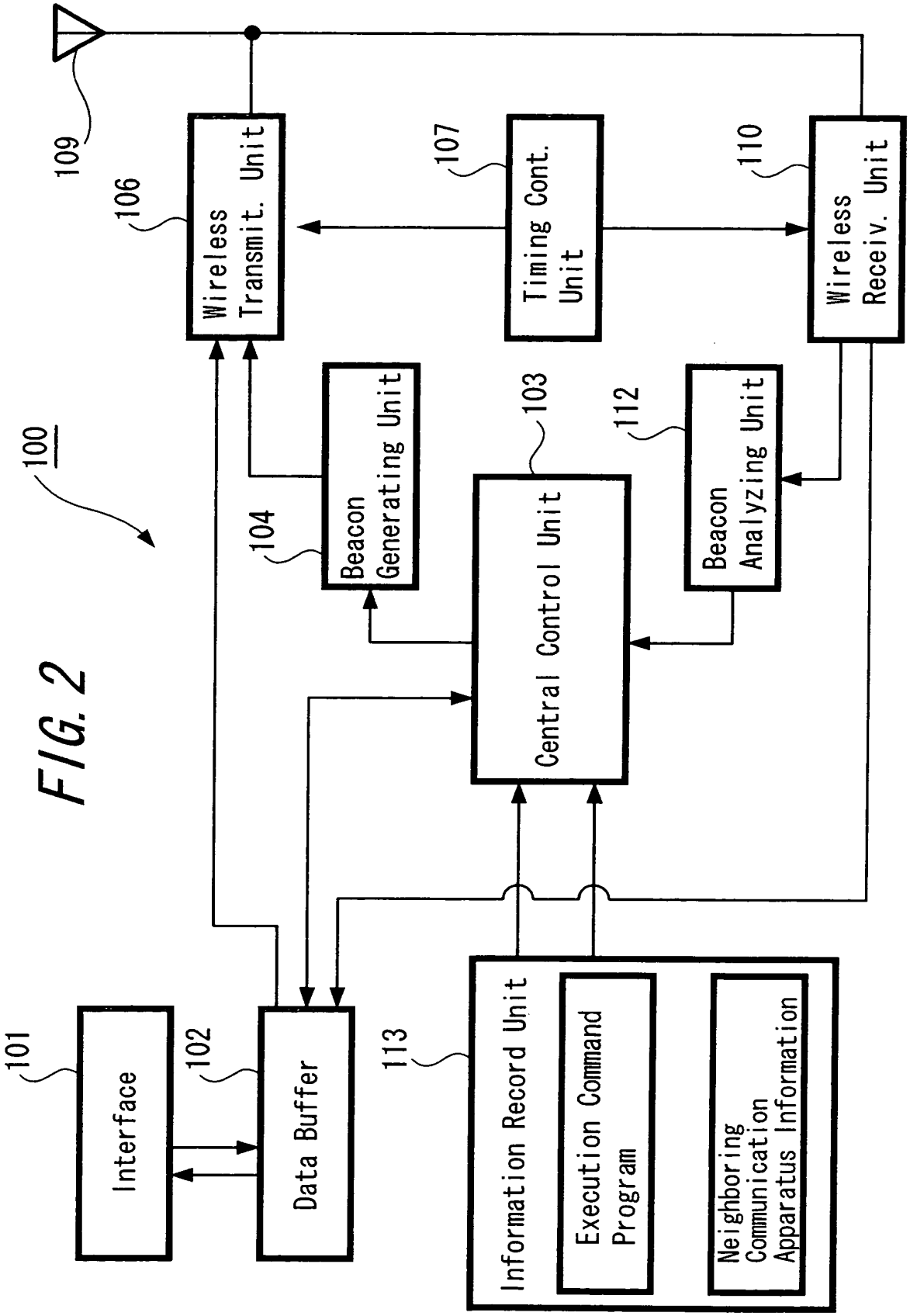

100
109
106
Wireless Transmit. Unit
107
Timing Cont. Unit
110
Wireless Receiv. Unit
104
Beacon Generating Unit
103
Central Control Unit
112
Beacon Analyzing Unit
101
Interface
102
Data Buffer
113
Information Record Unit
Execution Command Program
Neighboring Communication Apparatus Information

FIG. 3

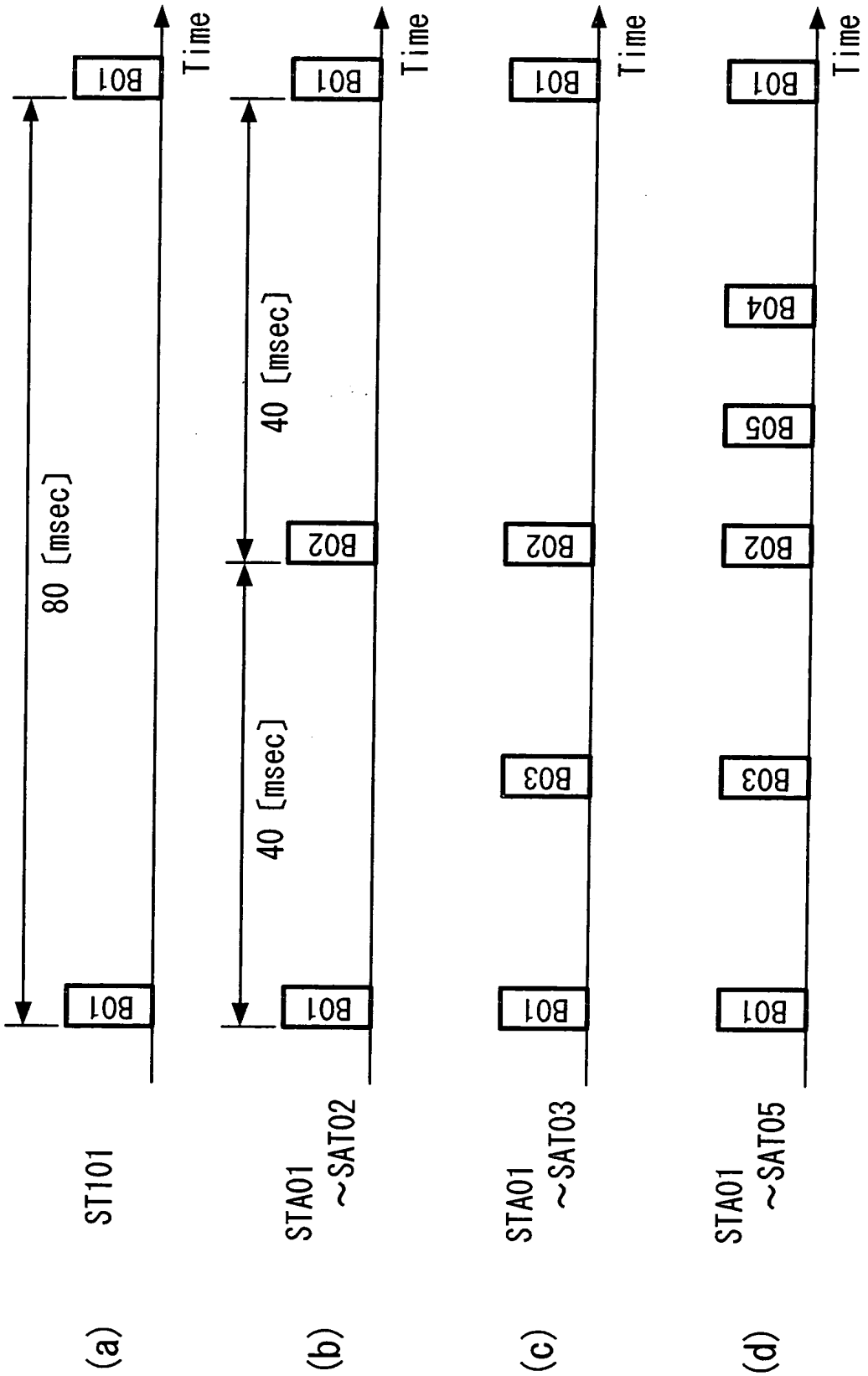

(a)
ST101
B01
80 [msec]
B01
Time
(b)
STA01
~SAT02
B01
40 [msec]
B02
40 [msec]
B01
Time
(c)
STA01
~SAT03
B01
B02
B03
B01
Time
(d)
STA01
~SAT05
B01
B02
B03
B04
B05
B01
Time

FIG. 4

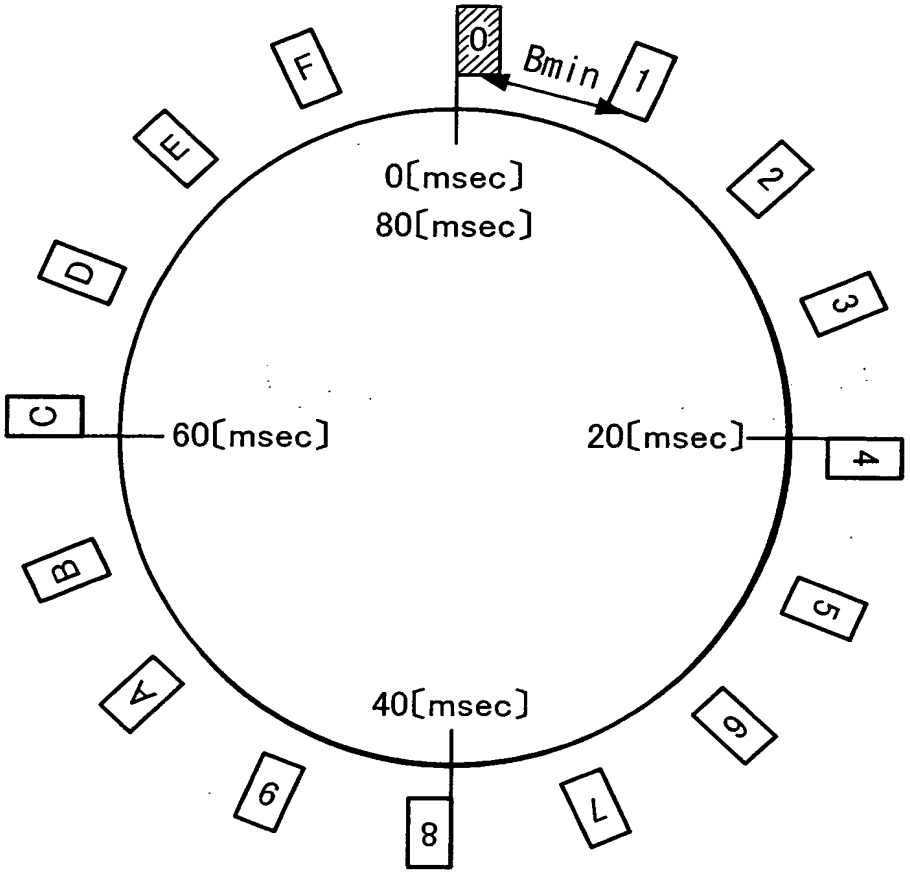

0
Bmin
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
0[msec]
80[msec]
20[msec]
40[msec]
60[msec]

FIG. 5

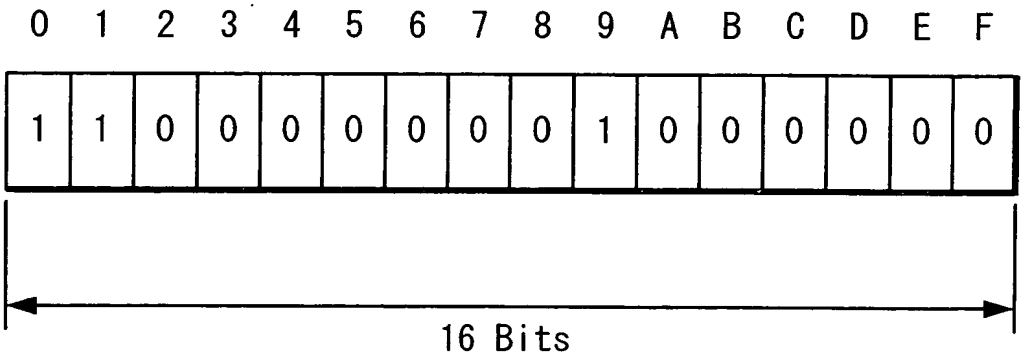

0 1 2 3 4 5 6 7 8 9 A B C D E F
1 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0
16 Bits

FIG. 6

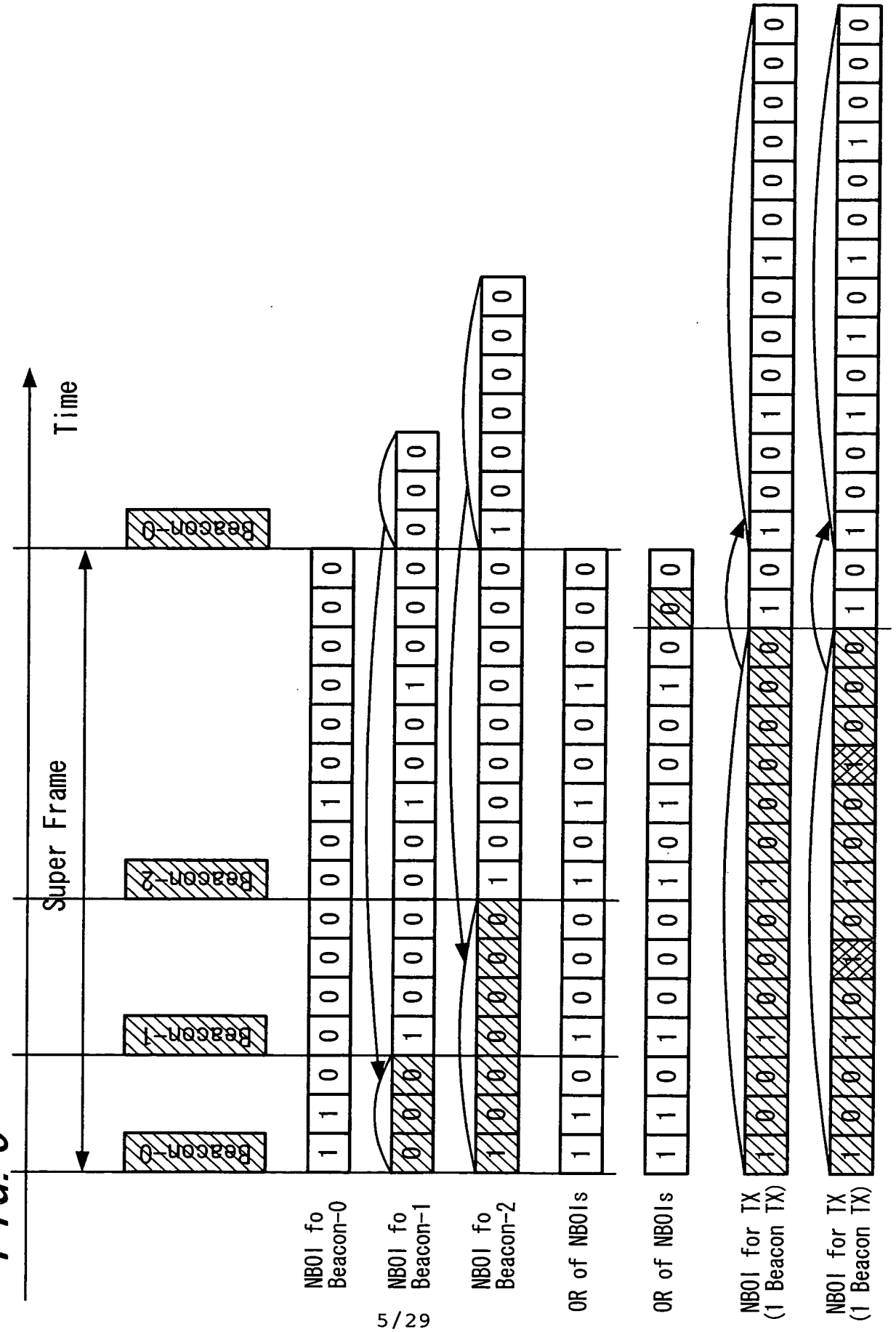

Time
Super Frame
Beacon-0
Beacon-1
Beacon-2
Beacon-0
NBOI fo Beacon-0
NBOI fo Beacon-1
NBOI fo Beacon-2
OR of NBOIs
OR of NBOIs
NBOI for TX (1 Beacon TX)
NBOI for TX (1 Beacon TX)

FIG. 7

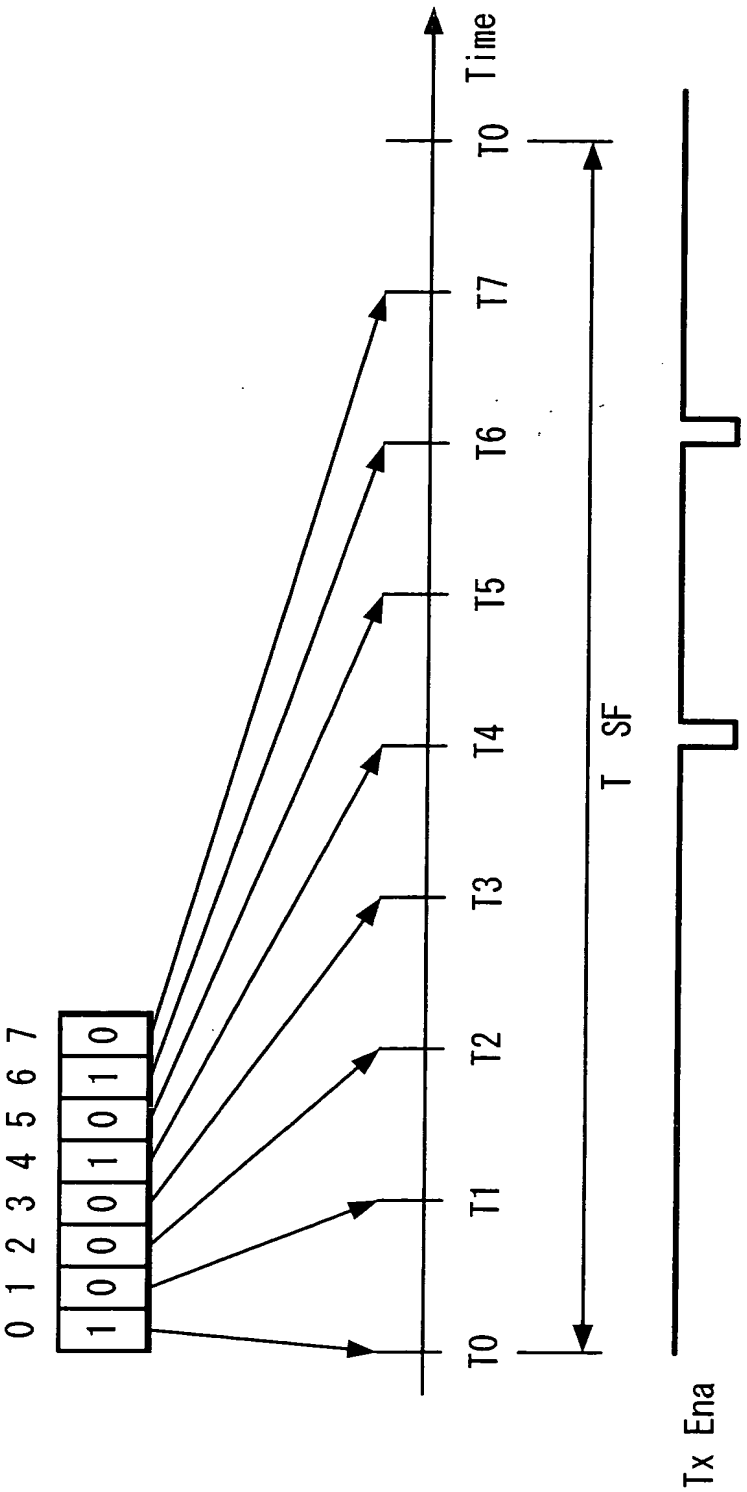


FIG. 8

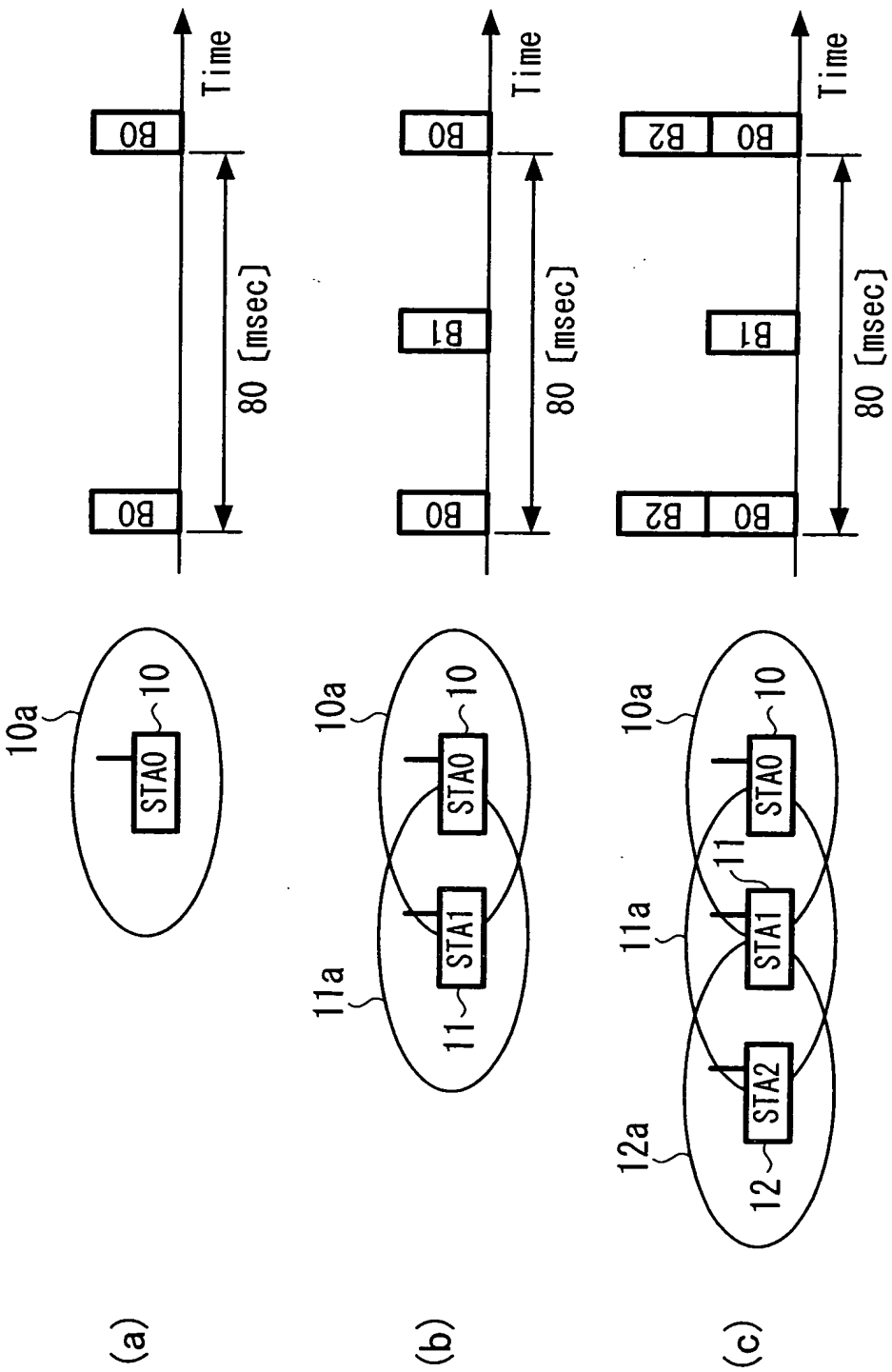


FIG. 9

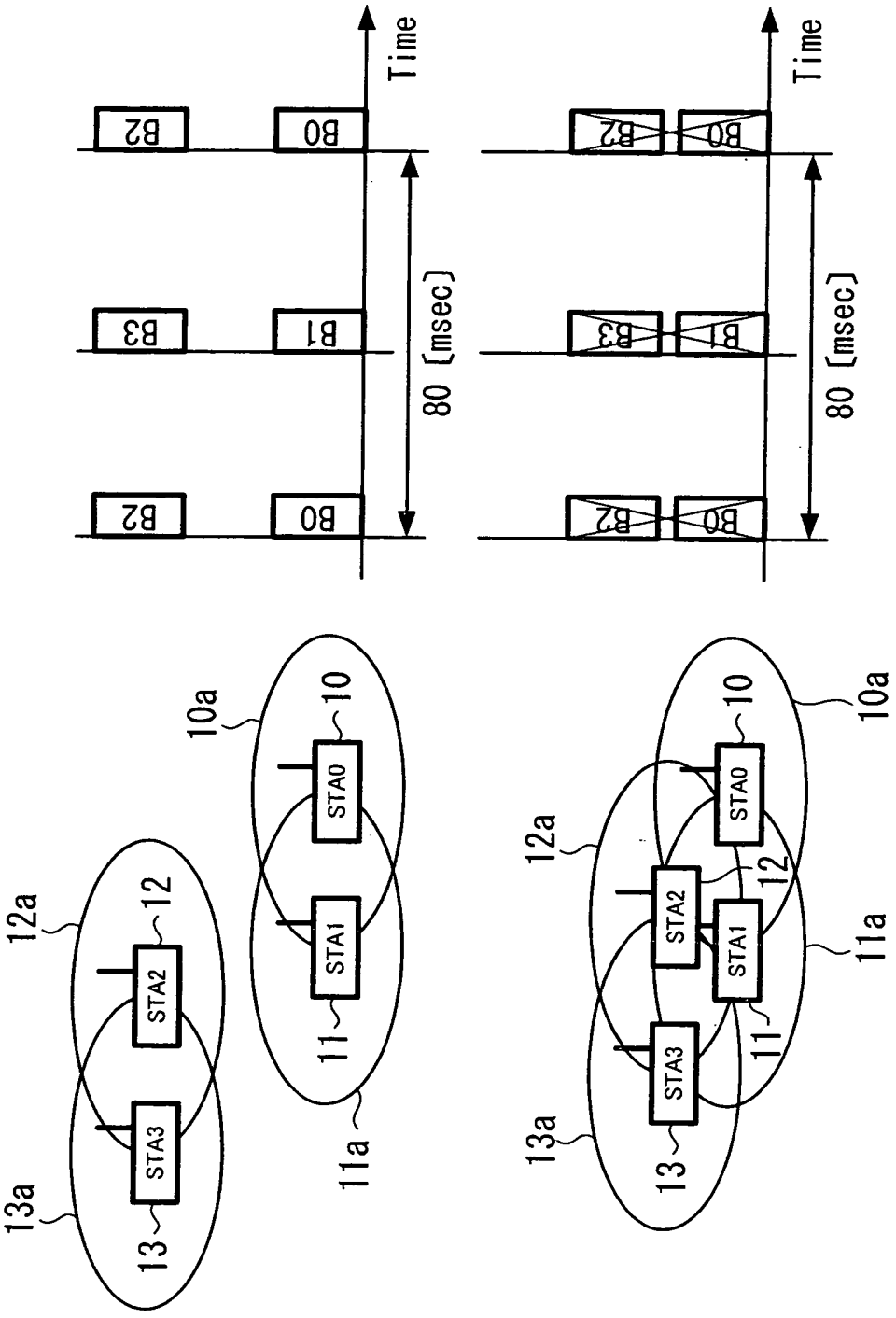

Time
80 [msec]
B0
B1
B2
B3
STA0
STA1
STA2
STA3
10
10a
11
11a
12
12a
13
13a

FIG. 10

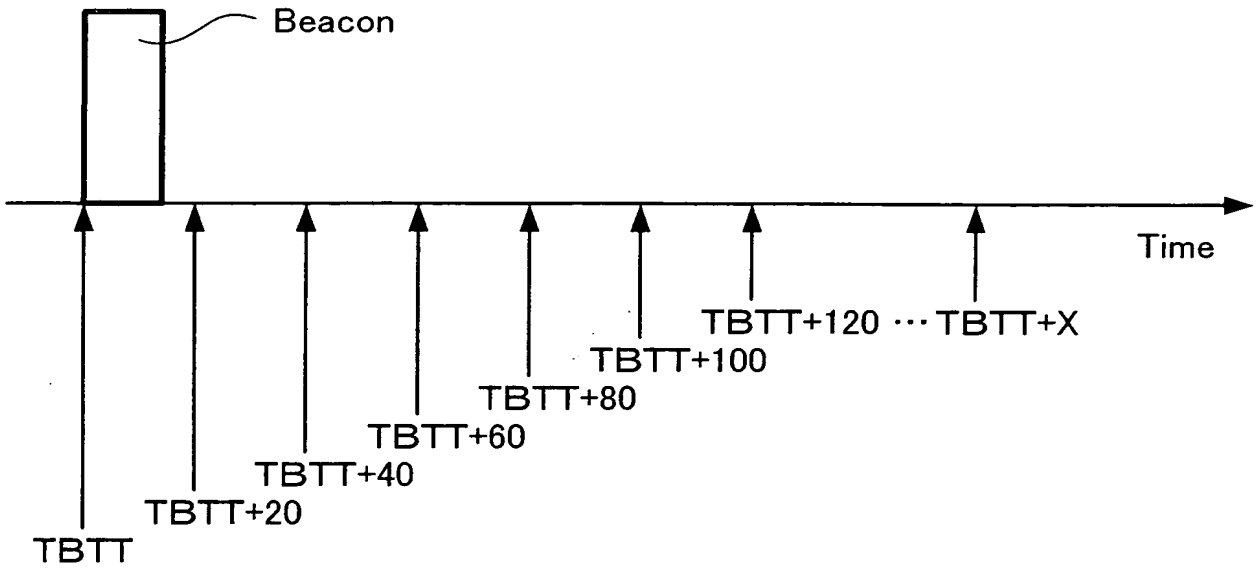


FIG. 11

000 :TBTT

001 :TBTT+20

010 :TBTT+40

011 :TBTT+60

100 :TBTT+80

101 :TBTT+100

110 :TBTT+120

111 :TBTT+X

FIG. 12

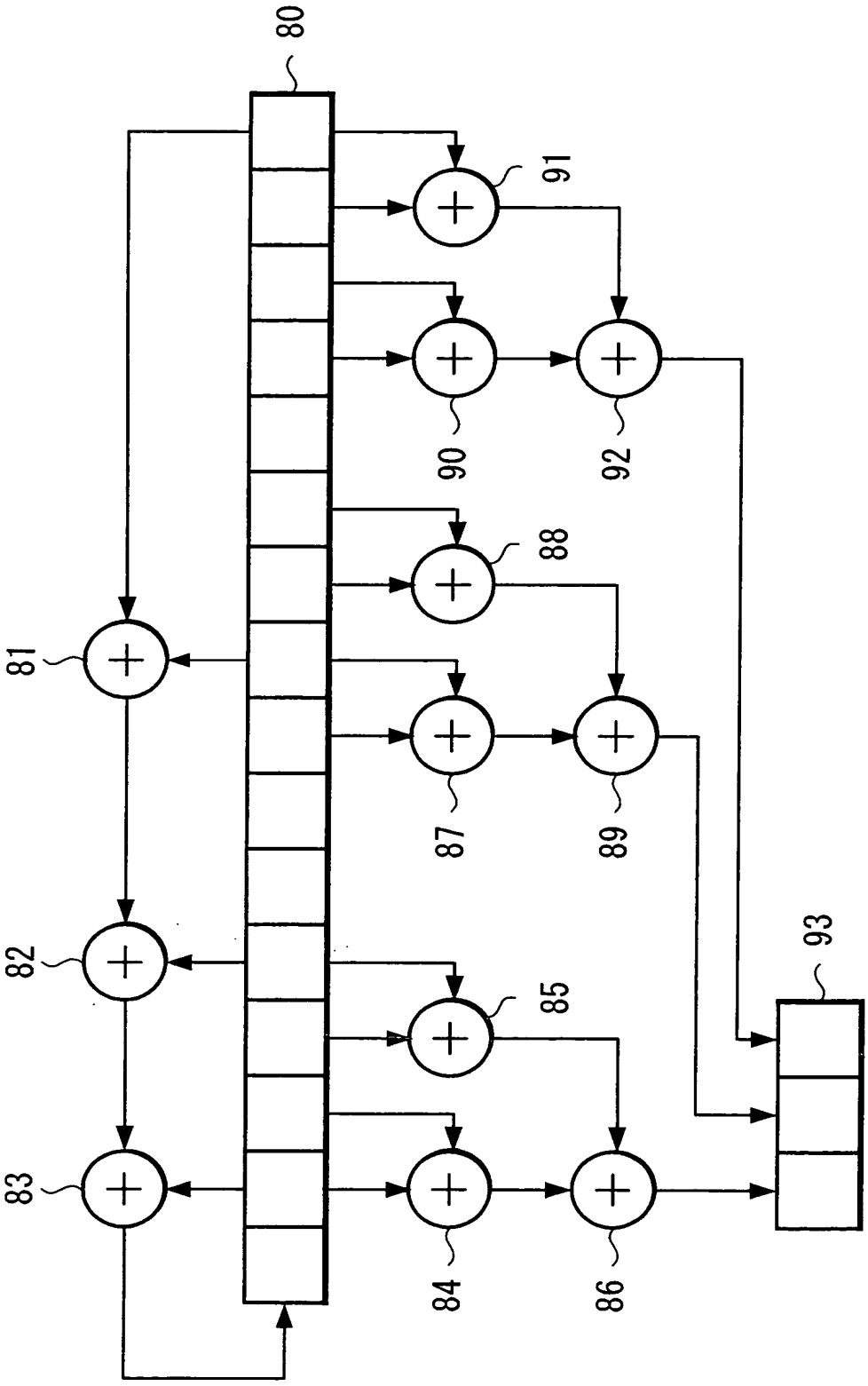


FIG. 13

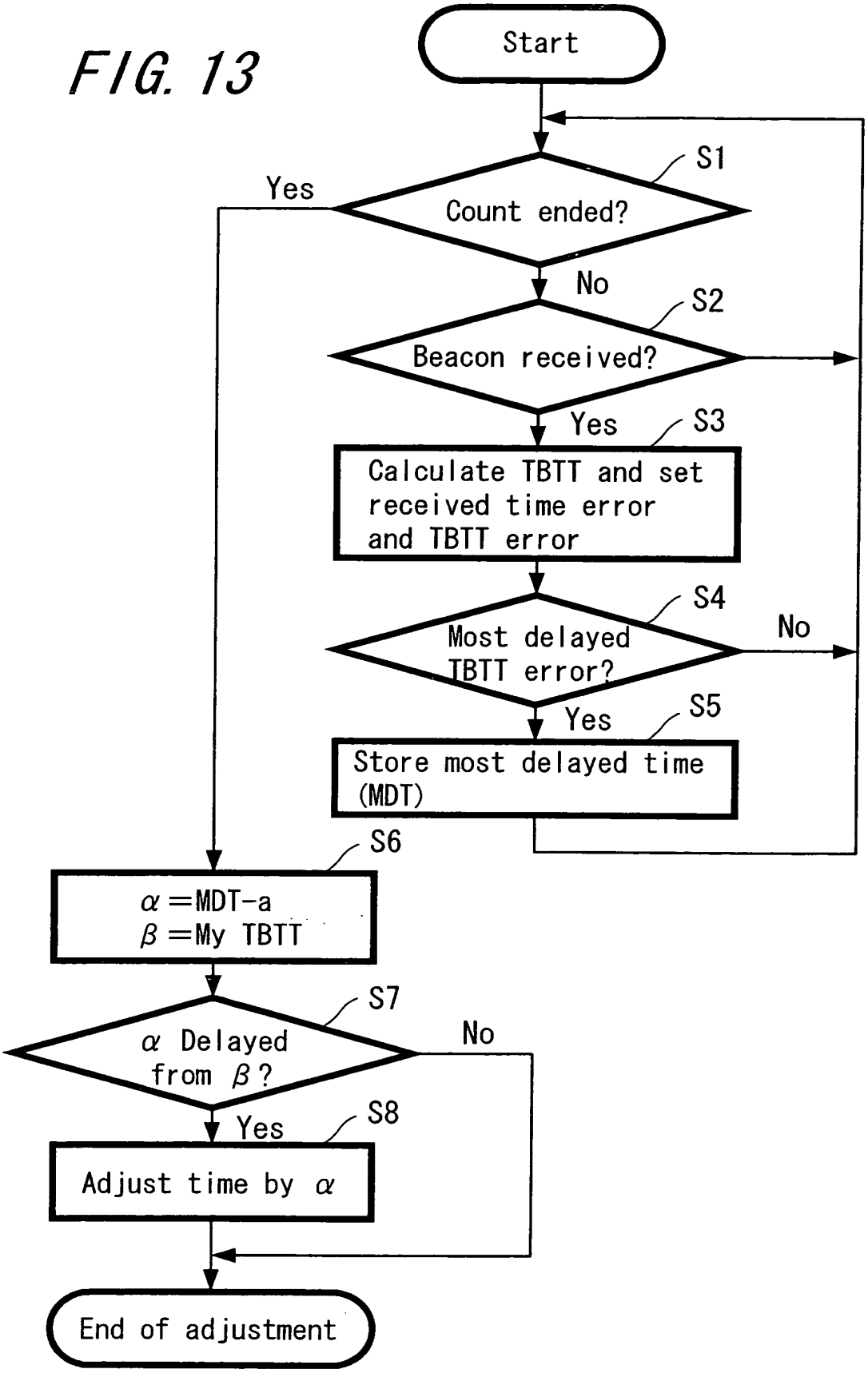

Start
S1
Count ended?
Yes
No
S2
Beacon received?
Yes
S3
Calculate TBTT and set received time error and TBTT error
S4
Most delayed TBTT error?
No
Yes
S5
Store most delayed time (MDT)
S6
α =MDT-a
β =My TBTT
S7
α Delayed from β ?
No
Yes
S8
Adjust time by α
End of adjustment

FIG. 14

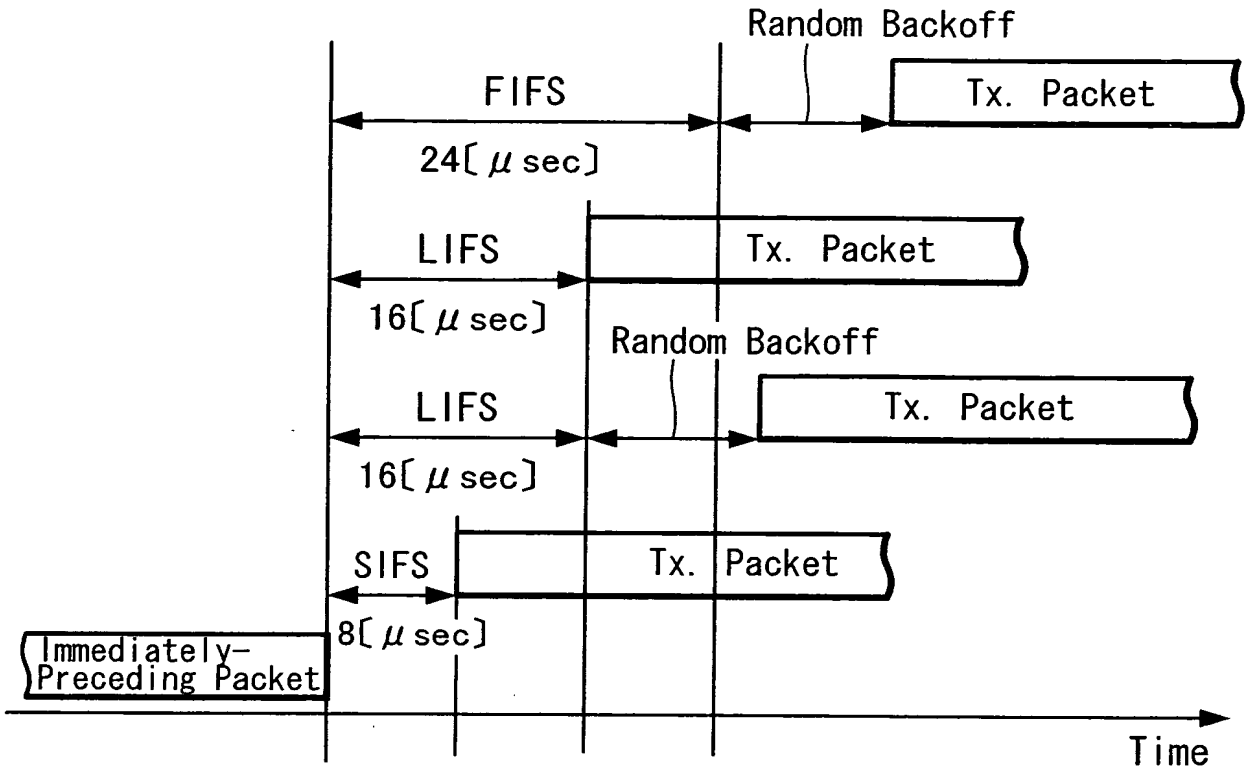

Random Backoff
FIFS
Tx. Packet
24[μsec]
LIFS
Tx. Packet
16[μsec]
Random Backoff
LIFS
Tx. Packet
16[μsec]
SIFS
Tx. Packet
8[μsec]
Immediately-Preceding Packet
Time

FIG. 15

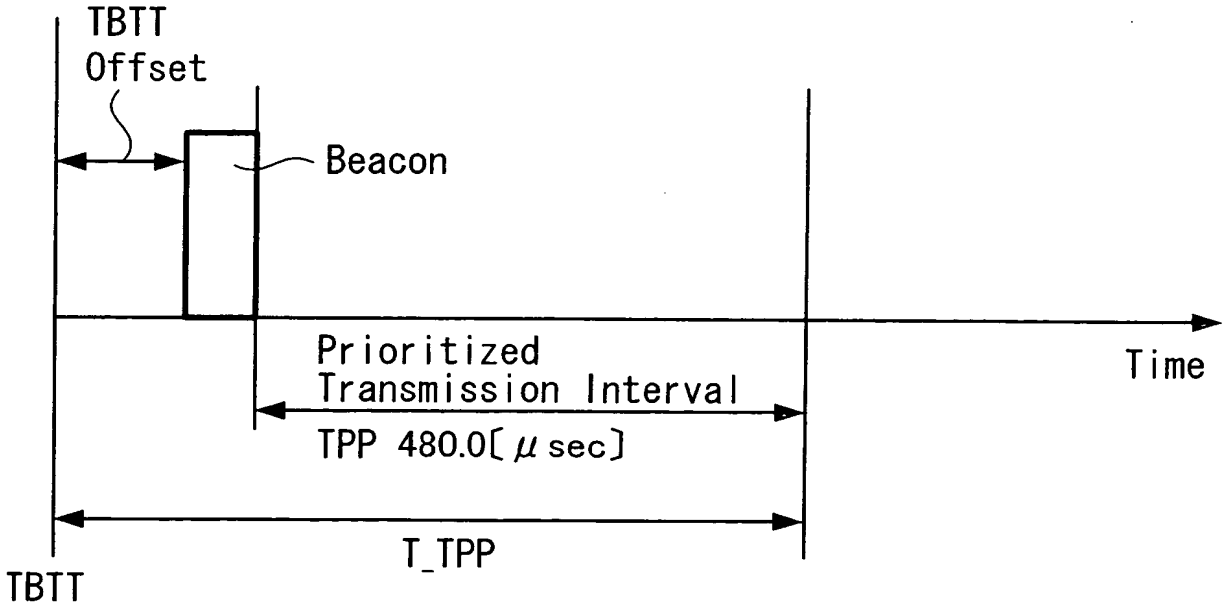

TBTT
Offset
Beacon
Prioritized
Transmission Interval
TPP 480.0[μsec]
Time
T_TPP
TBTT

FIG. 16

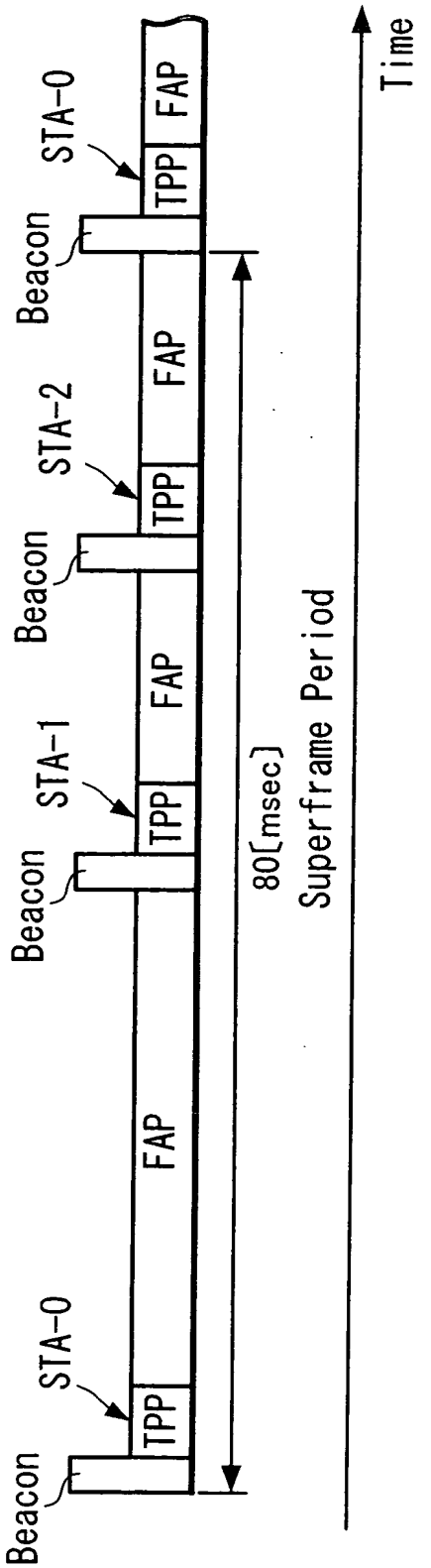

Beacon
STA-0
TPP
FAP
Beacon
STA-1
TPP
FAP
Beacon
STA-2
TPP
FAP
Beacon
STA-0
TPP
FAP
80[msec]
Superframe Period
Time

FIG. 17

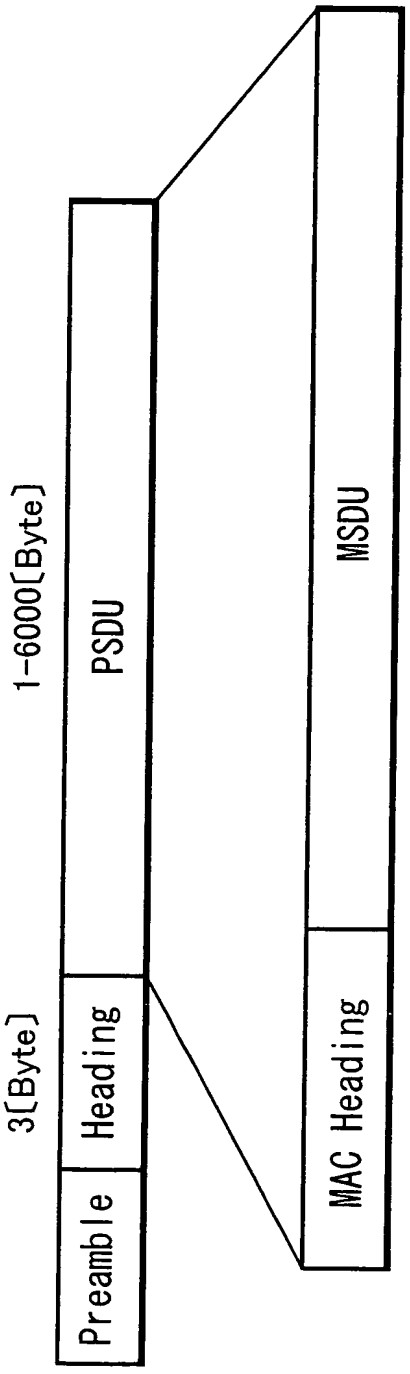

3[Byte]
Preamble
Heading
1-6000[Byte]
PSDU
MSDU
MAC Heading

FIG. 18

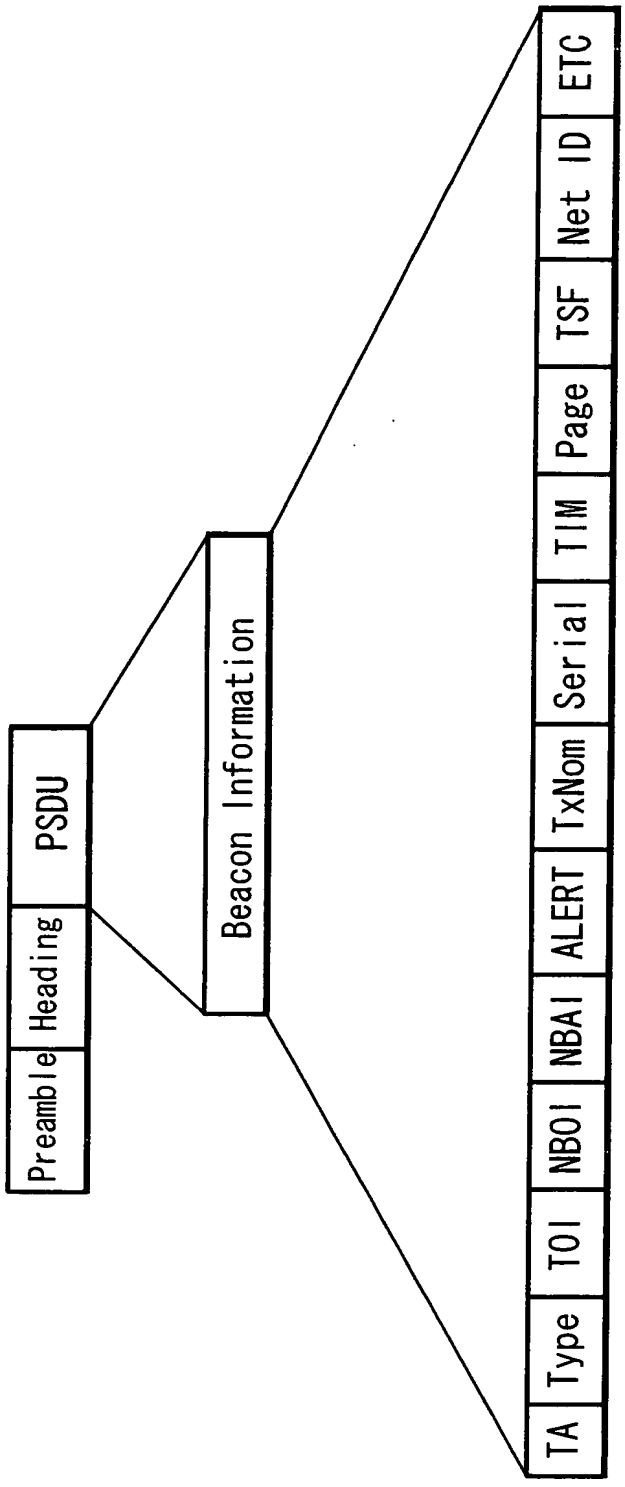

Preamble
Heading
PSDU
Beacon Information
TA
Type
TOI
NBOI
NBAI
ALERT
TxNom
Serial
TIM
Page
TSF
Net ID
ETC

FIG. 19

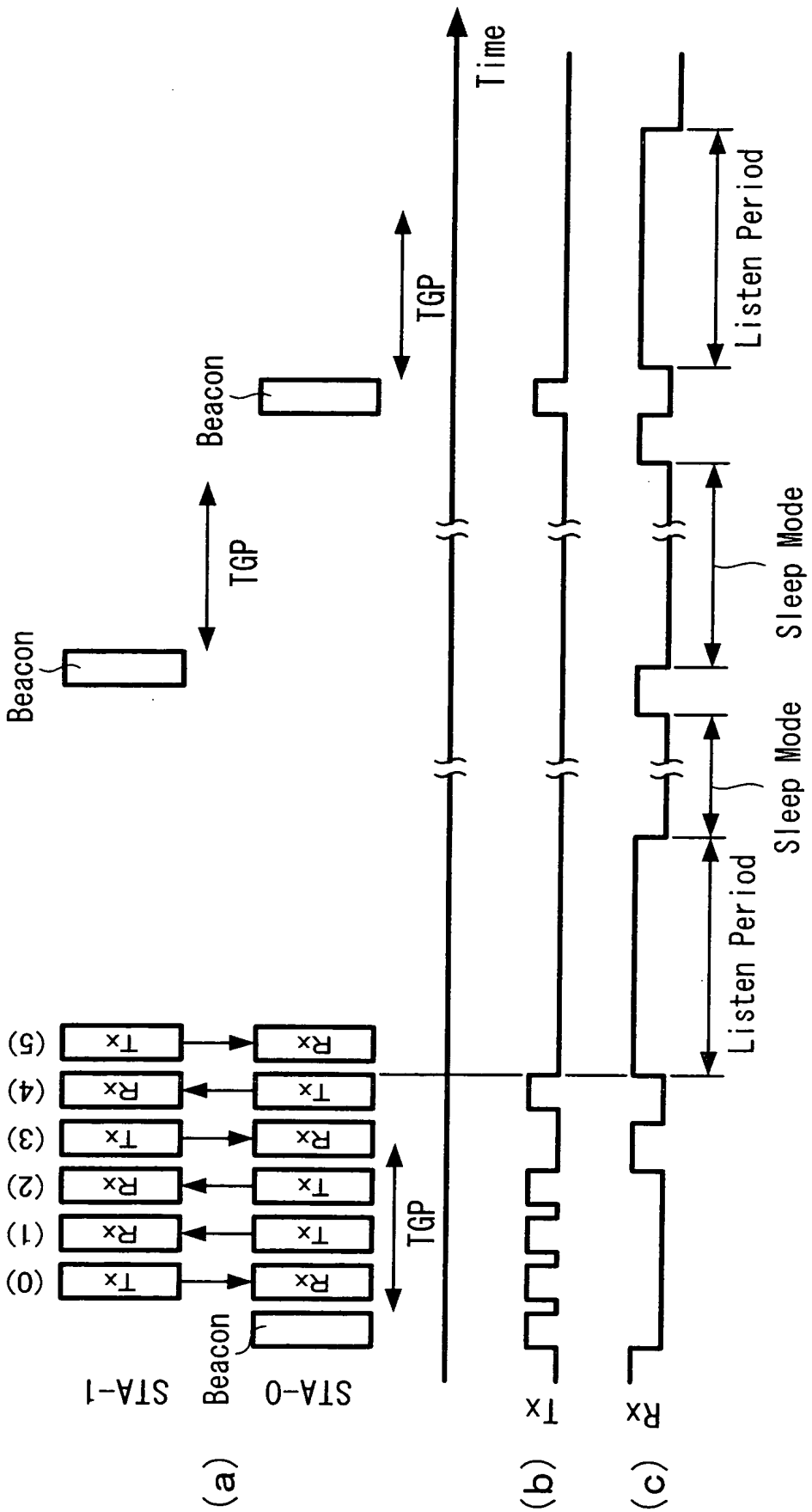

(a)
(b)
(c)
STA-0
STA-1
Beacon
Beacon
Beacon
TGP
TGP
TGP
Time
Tx
Rx
(0)
(1)
(2)
(3)
(4)
(5)
Listen Period
Sleep Mode
Sleep Mode
Listen Period

FIG. 20

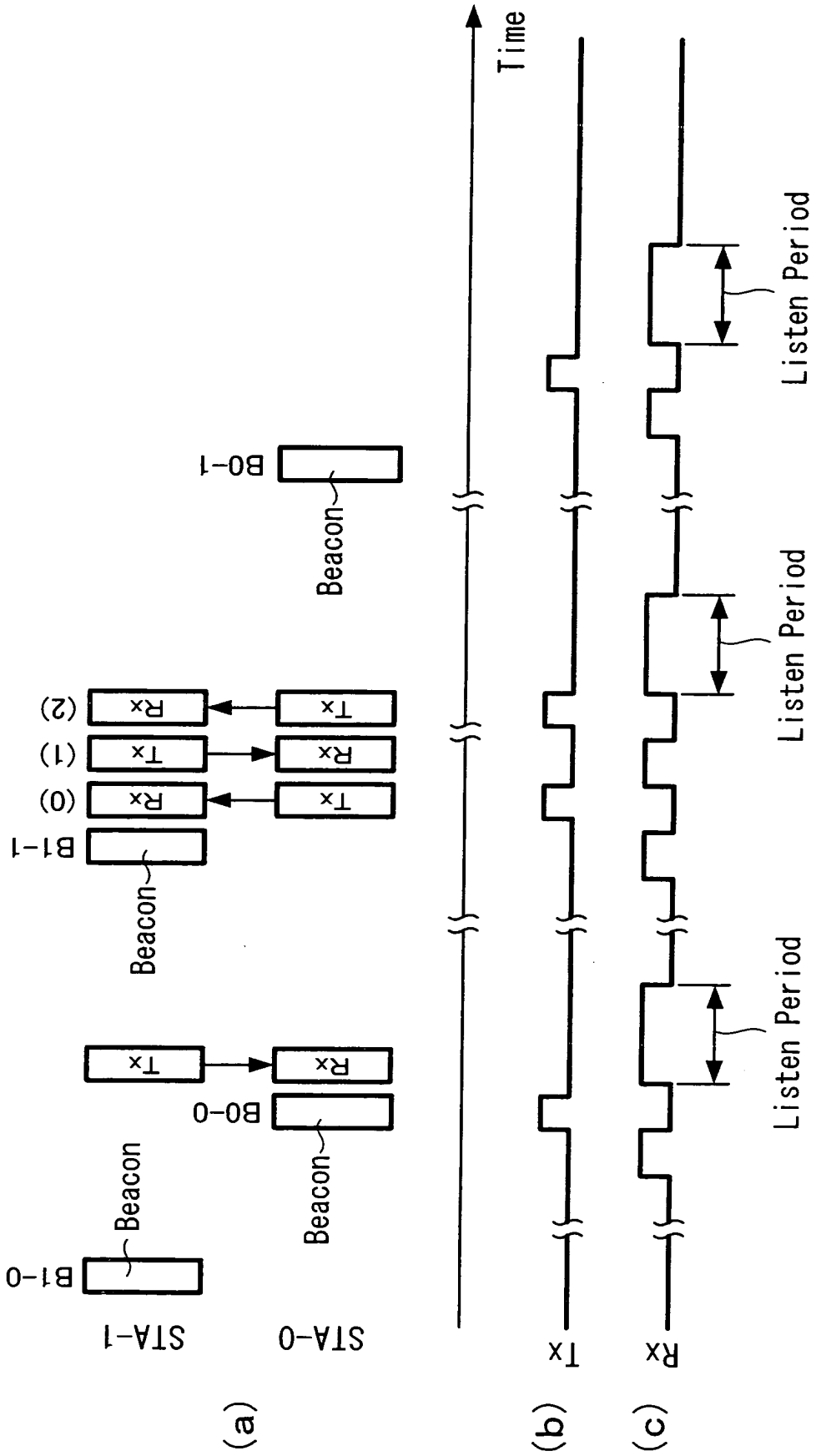

(a)
STA-0
STA-1
B1-0
Beacon
B0-0
Beacon
Tx
Rx
B0-1
Beacon
B1-1
Beacon
(0)
(1)
(2)
Tx
Rx
Time
(b)
Tx
(c)
Rx
Listen Period
Listen Period
Listen Period

FIG. 21

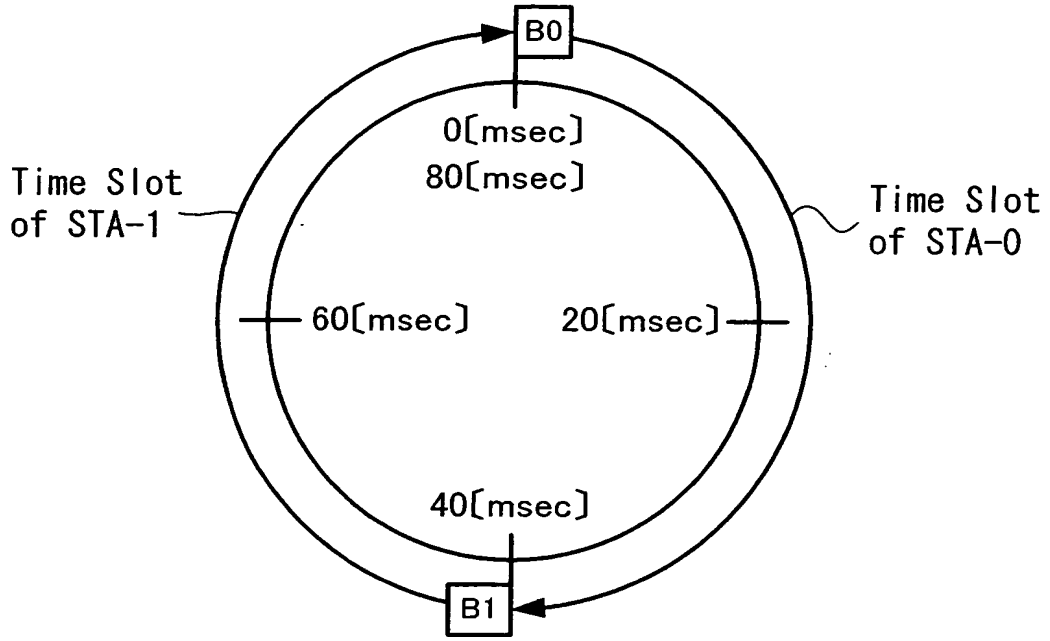

B0
0[msec]
80[msec]
Time Slot
of STA-1
Time Slot
of STA-0
60[msec]
20[msec]
40[msec]
B1

FIG. 22

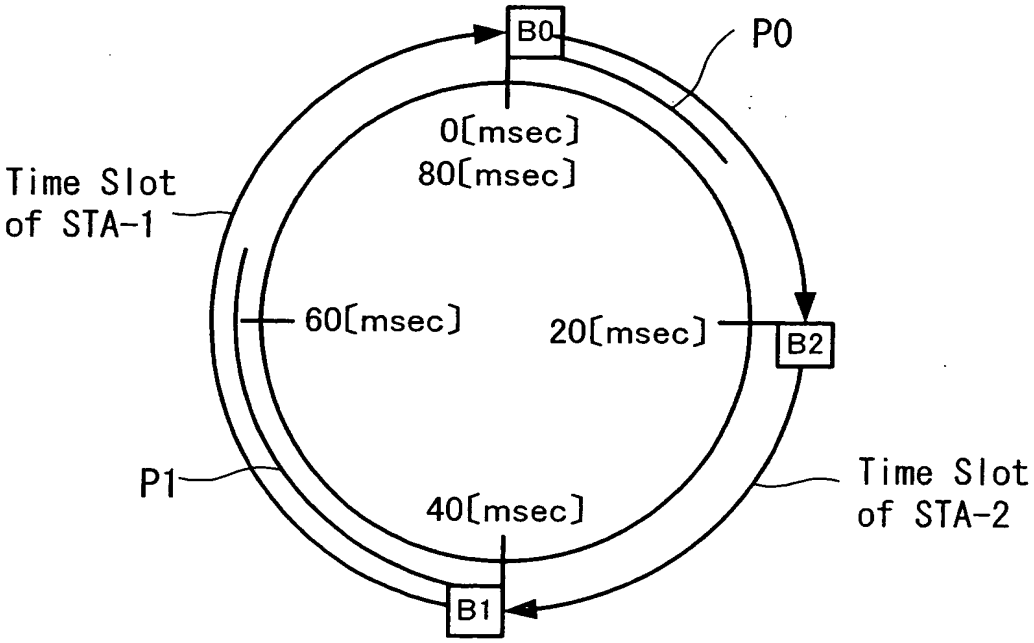

B0
P0
0[msec]
80[msec]
Time Slot
of STA-1
60[msec]
20[msec]
B2
P1
Time Slot
of STA-2
40[msec]
B1

FIG. 23

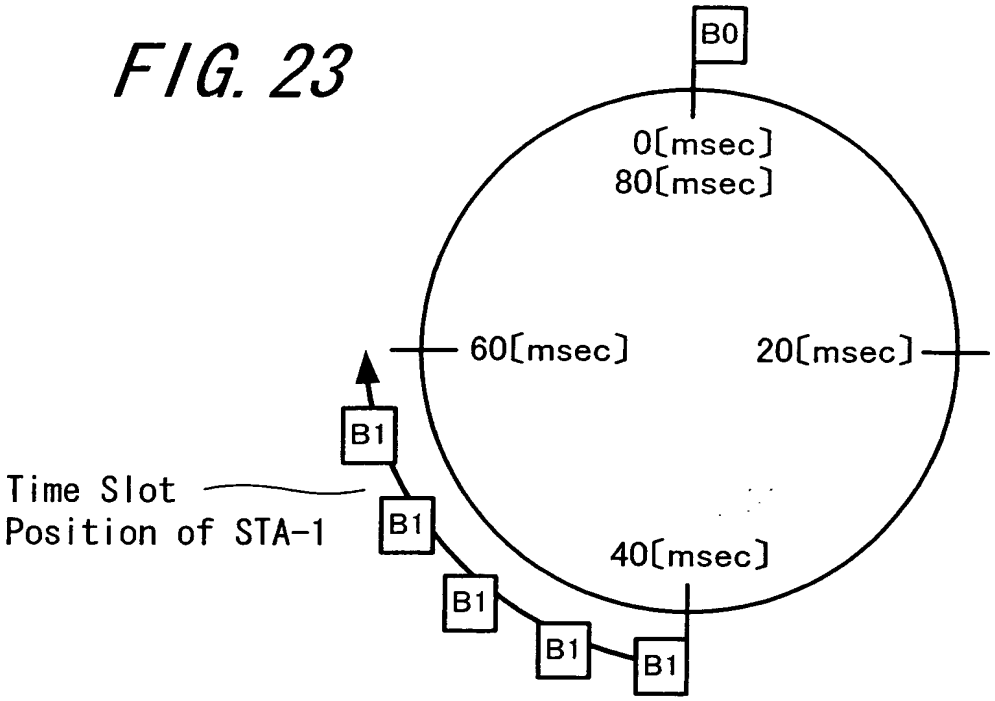

B0
0[msec]
80[msec]
60[msec]
20[msec]
40[msec]
B1
B1
B1
B1
B1
Time Slot
Position of STA-1

FIG. 24

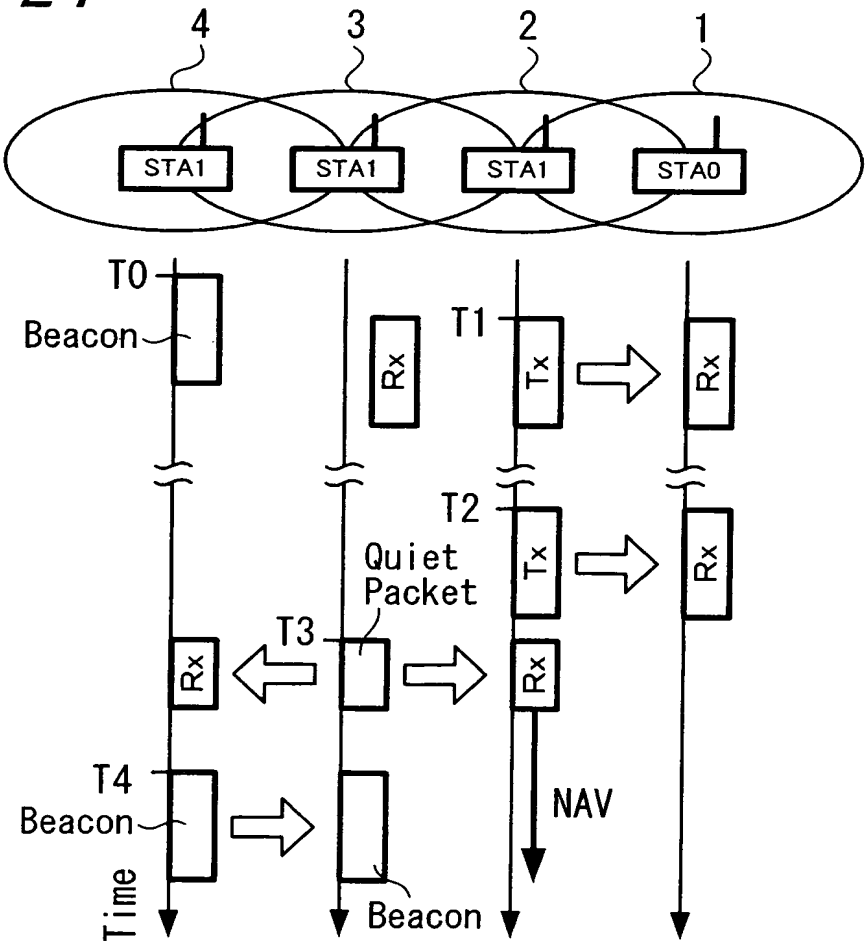

4
3
2
1
STA1
STA1
STA1
STA0
T0
Beacon
Rx
T1
Tx
Rx
T2
Tx
Rx
Quiet
Packet
T3
Rx
Rx
T4
Beacon
NAV
Time
Beacon

FIG. 25

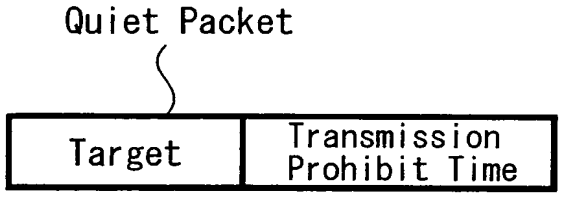

Quiet Packet
Target
Transmission Prohibit Time

FIG. 26

Preamble
PHY Header
PHY Service Data Unit (PSDU)

FIG. 27

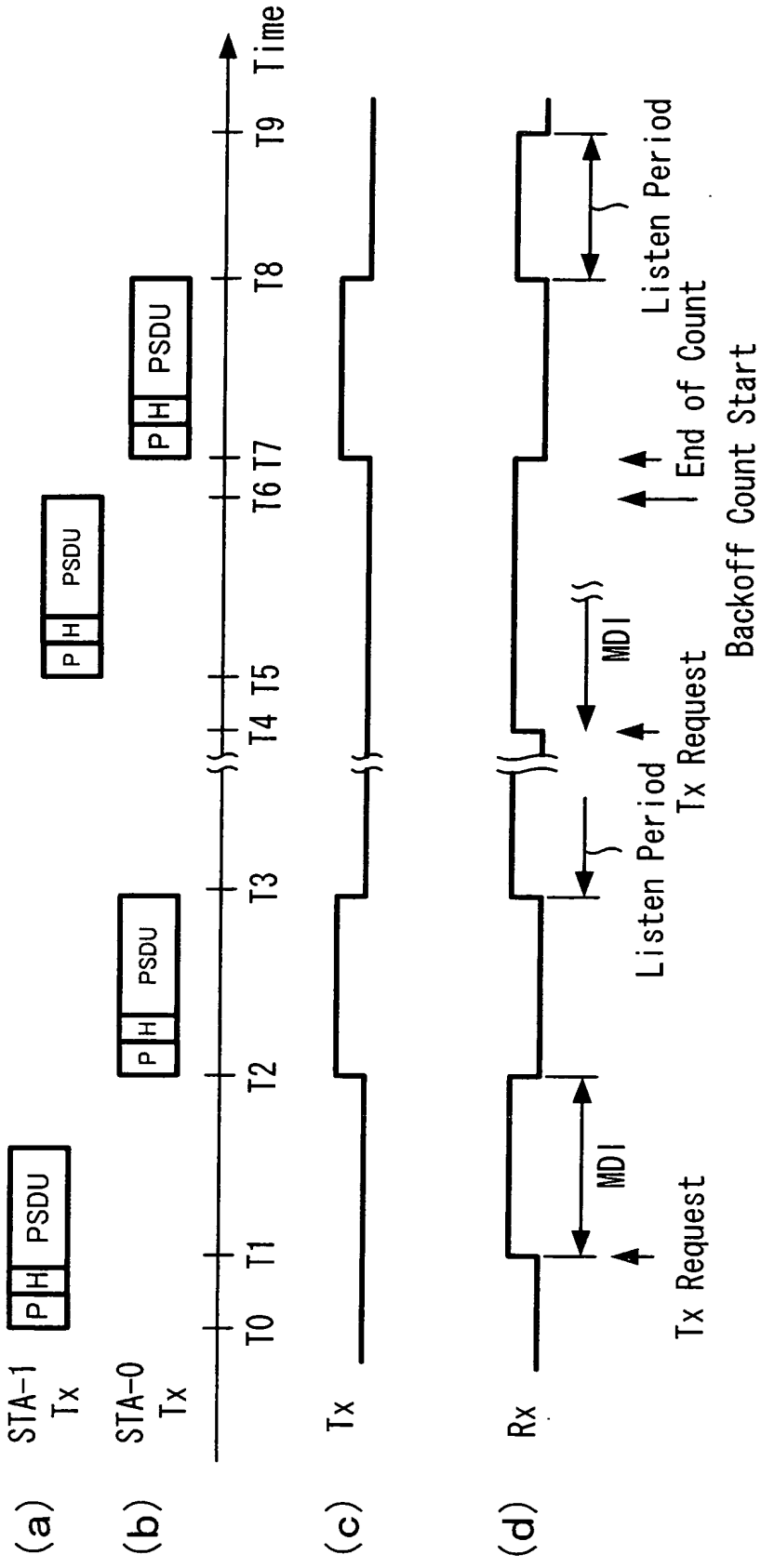

(a)
STA-1 Tx
P H PSDU
(b)
STA-0 Tx
P H PSDU
P H PSDU
(c)
Tx
(d)
Rx
MDI
Tx Request
Listen Period
MDI
Tx Request
Listen Period
End of Count
Backoff Count Start
T0 T1 T2 T3 T4 T5 T6 T7 T8 T9 Time

FIG. 28

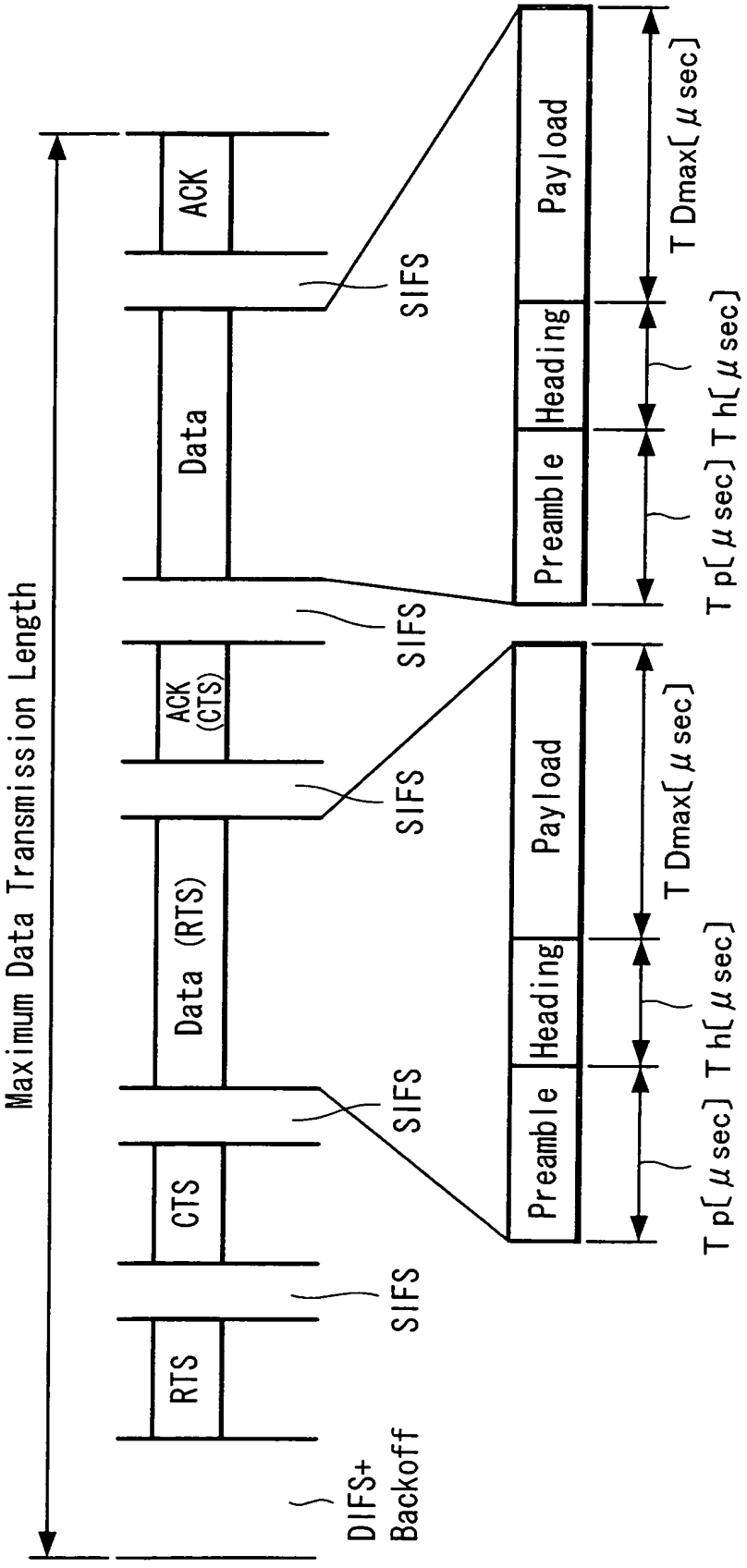
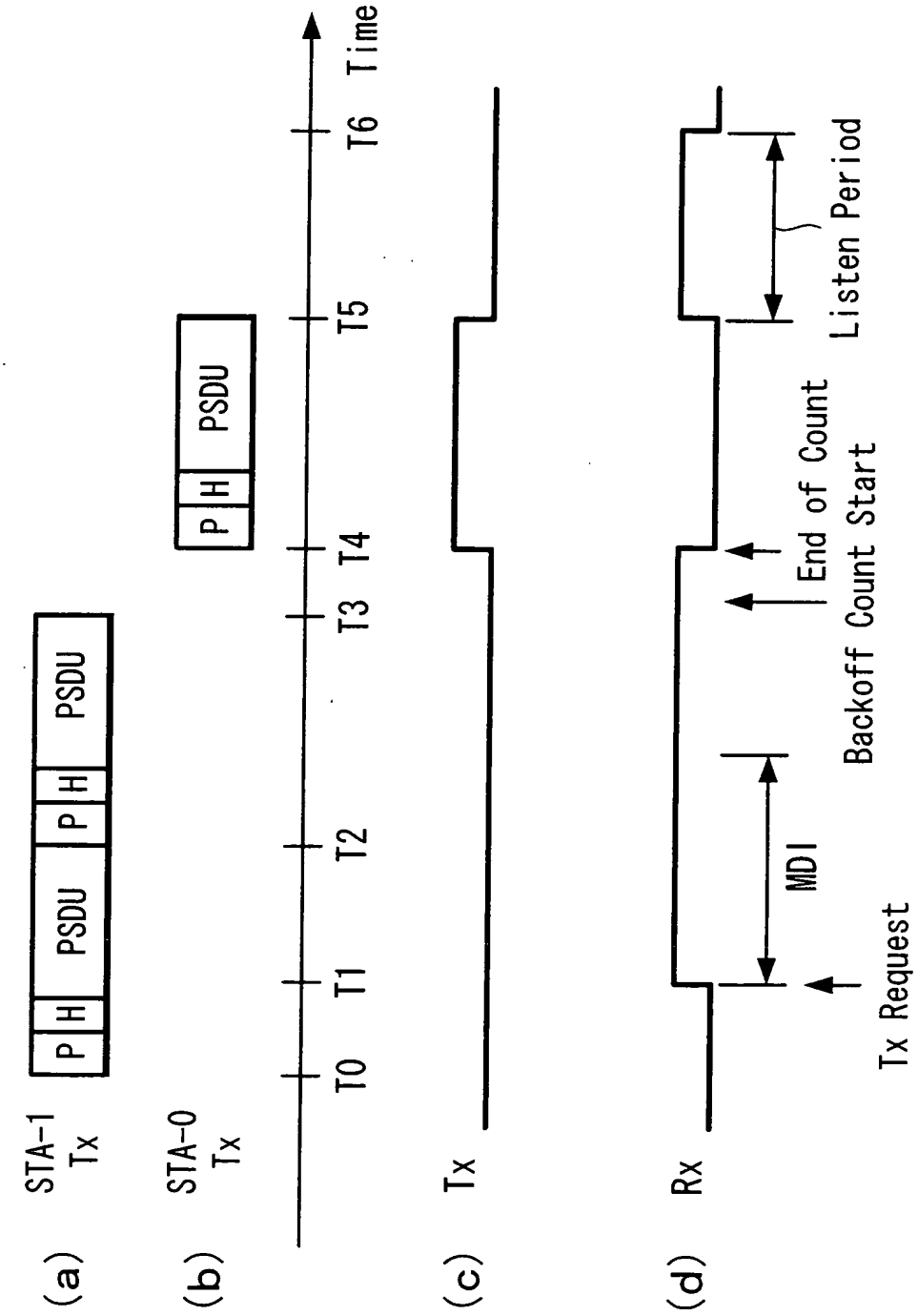

Maximum Data Transmission Length
DIFS+
Backoff
RTS
SIFS
CTS
SIFS
Data (RTS)
SIFS
ACK
(CTS)
SIFS
Data
SIFS
ACK
Preamble
Heading
Payload
T p[μsec]
T h[μsec]
T Dmax[μsec]
Preamble
Heading
Payload
T p[μsec]
T h[μsec]
T Dmax[μsec]

FIG. 29


(a)
STA-1 Tx
P
H
PSDU
P
H
PSDU
(b)
STA-0 Tx
P
H
PSDU
T0
T1
T2
T3
T4
T5
T6
Time
(c)
Tx
(d)
Rx
MDI
Tx Request
End of Count
Backoff Count Start
Listen Period

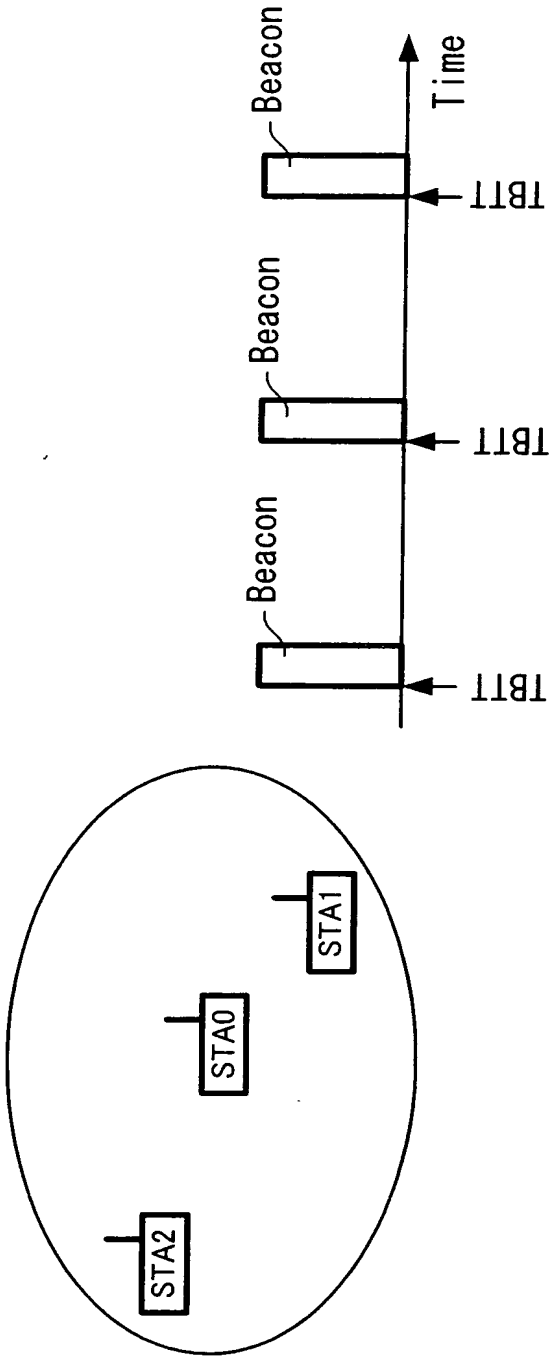

Beacon
Time
TBTT
Beacon
TBTT
Beacon
TBTT
STA1
STA0
STA2

FIG. 30

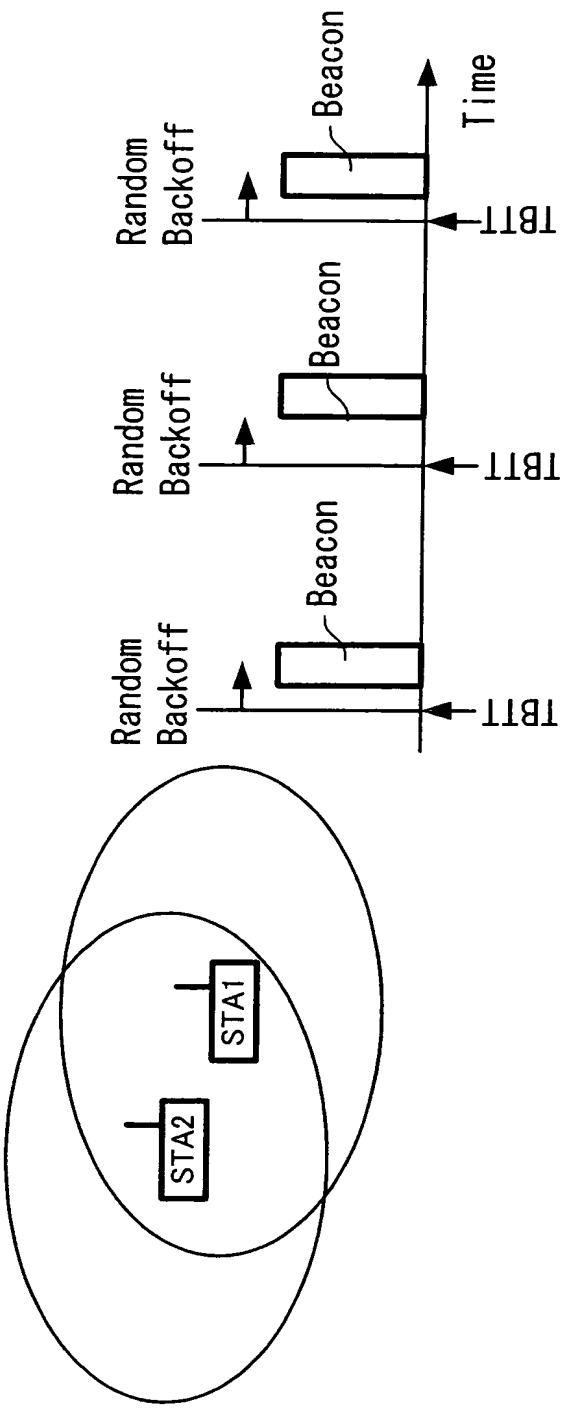

Random Backoff
Beacon
Time
TBTT
Random Backoff
Beacon
TBTT
Random Backoff
Beacon
TBTT
STA1
STA2

FIG. 31

FIG. 32

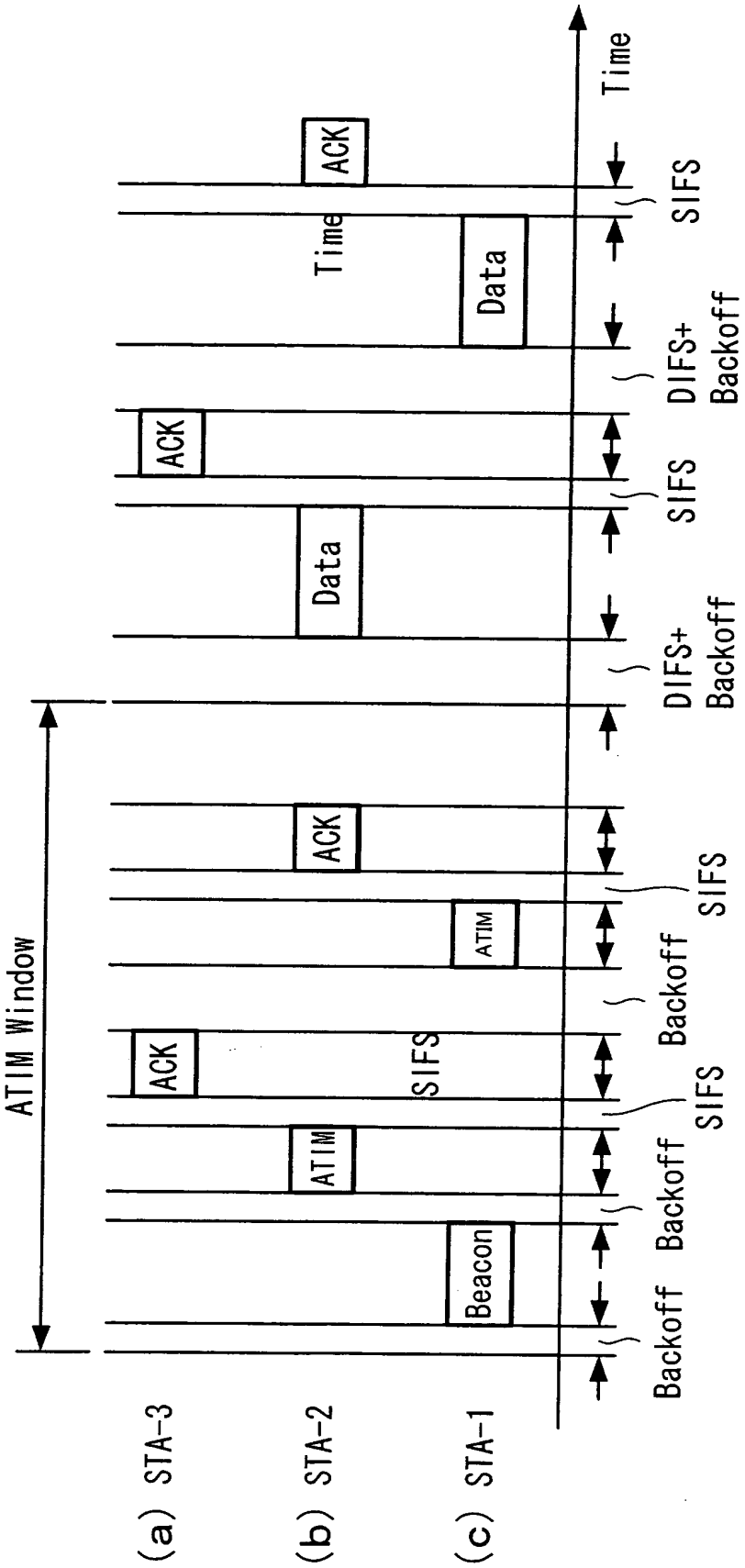

(a) STA-3
(b) STA-2
(c) STA-1
ATIM Window
Beacon
ATIM
ACK
Data
Backoff
SIFS
DIFS+
Time

FIG. 33

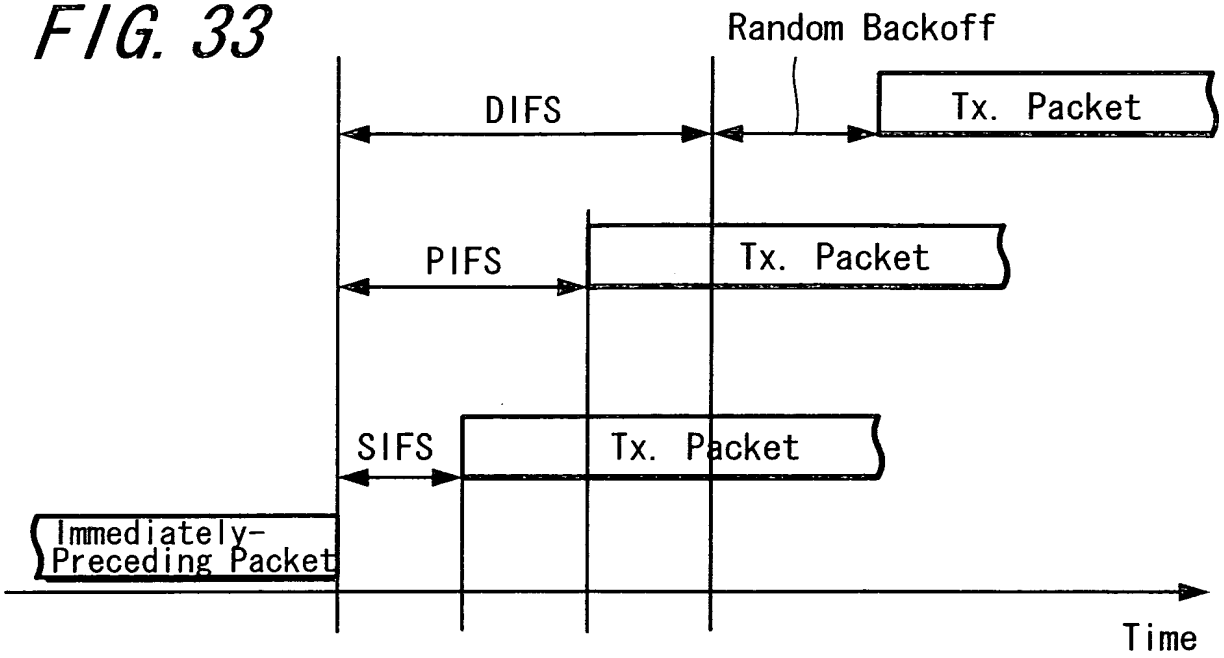

Random Backoff
DIFS
Tx. Packet
PIFS
Tx. Packet
SIFS
Tx. Packet
Immediately-
Preceding Packet
Time

FIG. 34

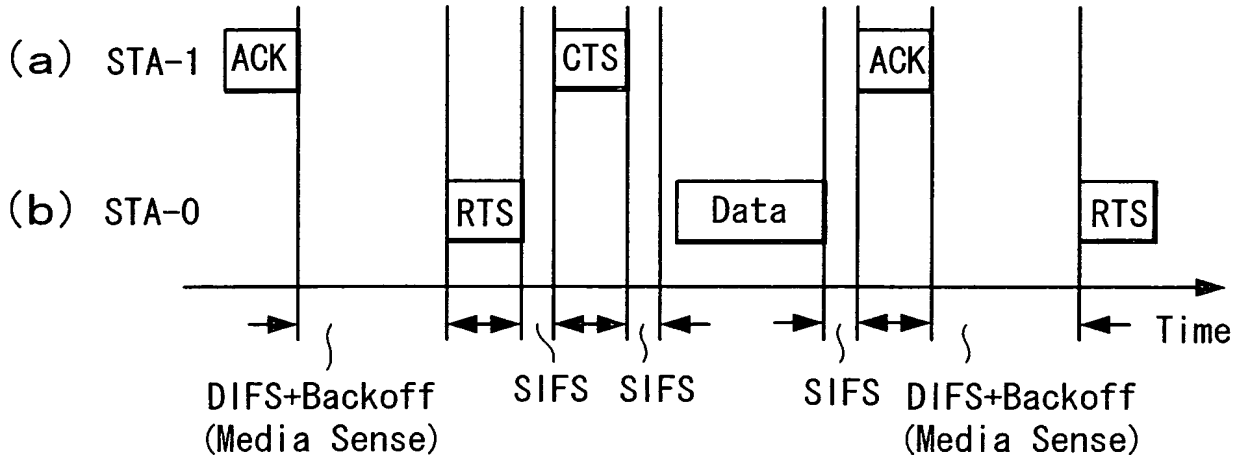

(a) STA-1
ACK
CTS
ACK
(b) STA-0
RTS
Data
RTS
Time
DIFS+Backoff
(Media Sense)
SIFS
SIFS
SIFS
DIFS+Backoff
(Media Sense)

FIG. 35

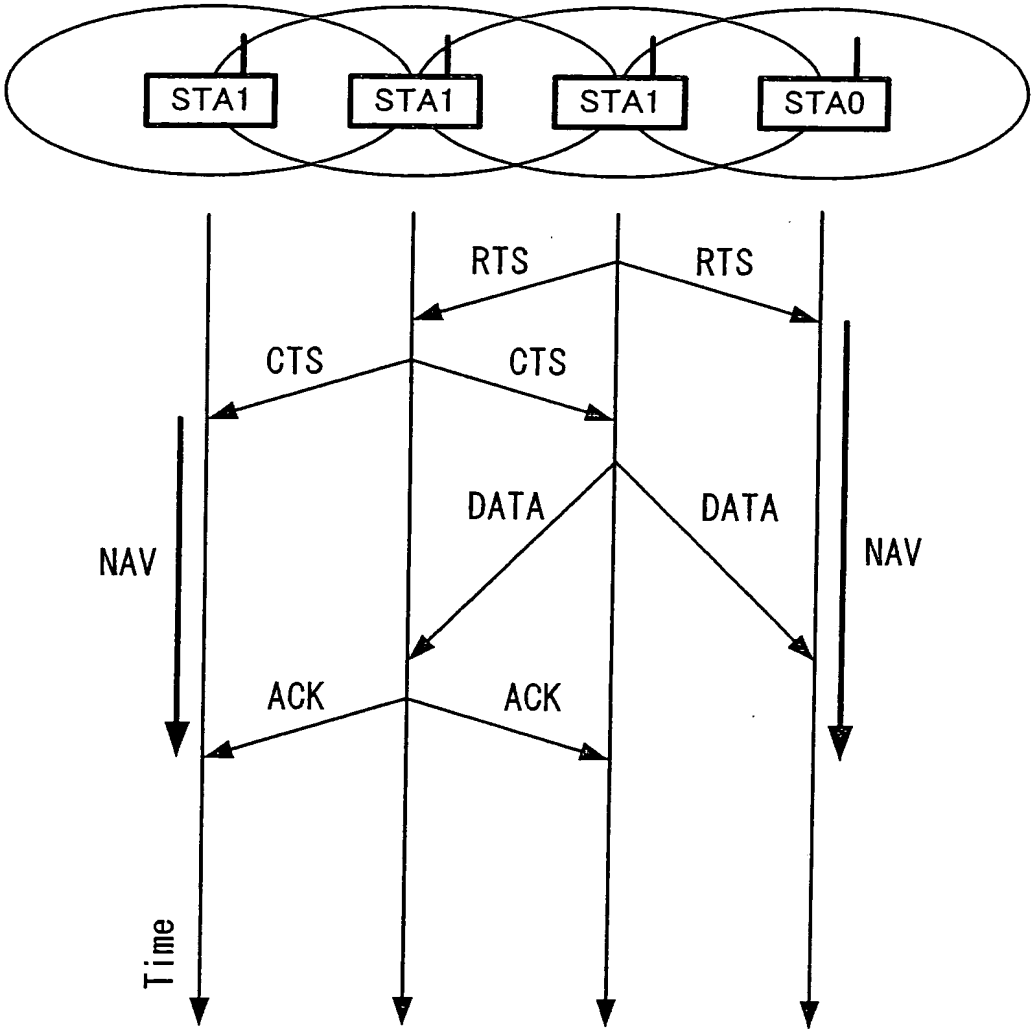

STA1
STA1
STA1
STA0
RTS
RTS
CTS
CTS
DATA
DATA
NAV
NAV
ACK
ACK
Time

FIG. 36

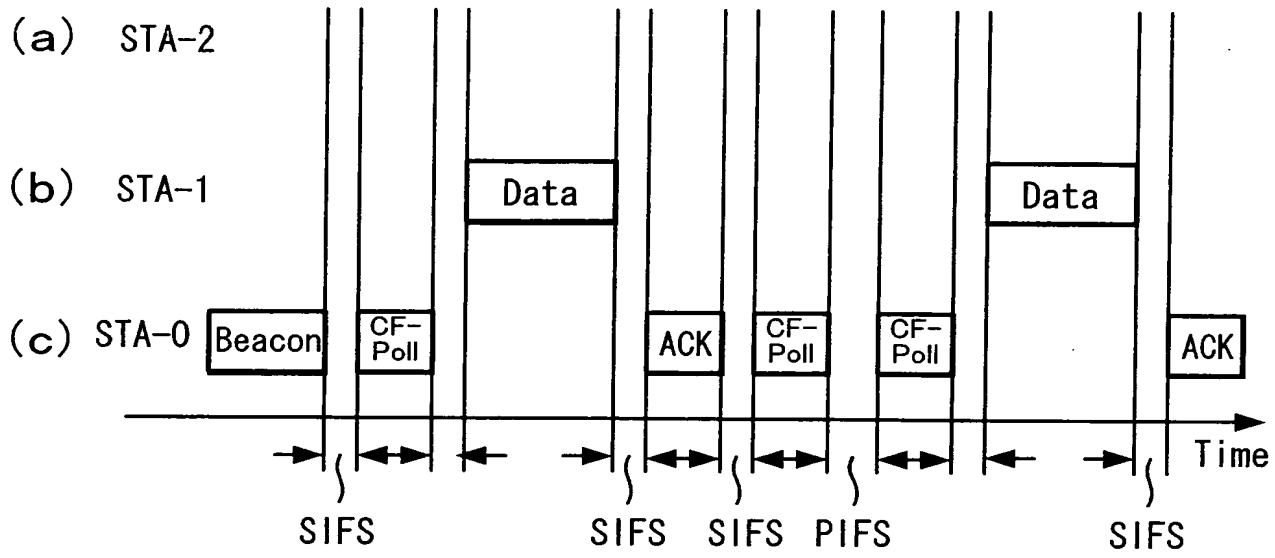

(a) STA-2
(b) STA-1
(c) STA-0
Beacon
CF-Poll
Data
ACK
CF-Poll
CF-Poll
Data
ACK
Time
SIFS
SIFS
SIFS
PIFS
SIFS

FIG. 37

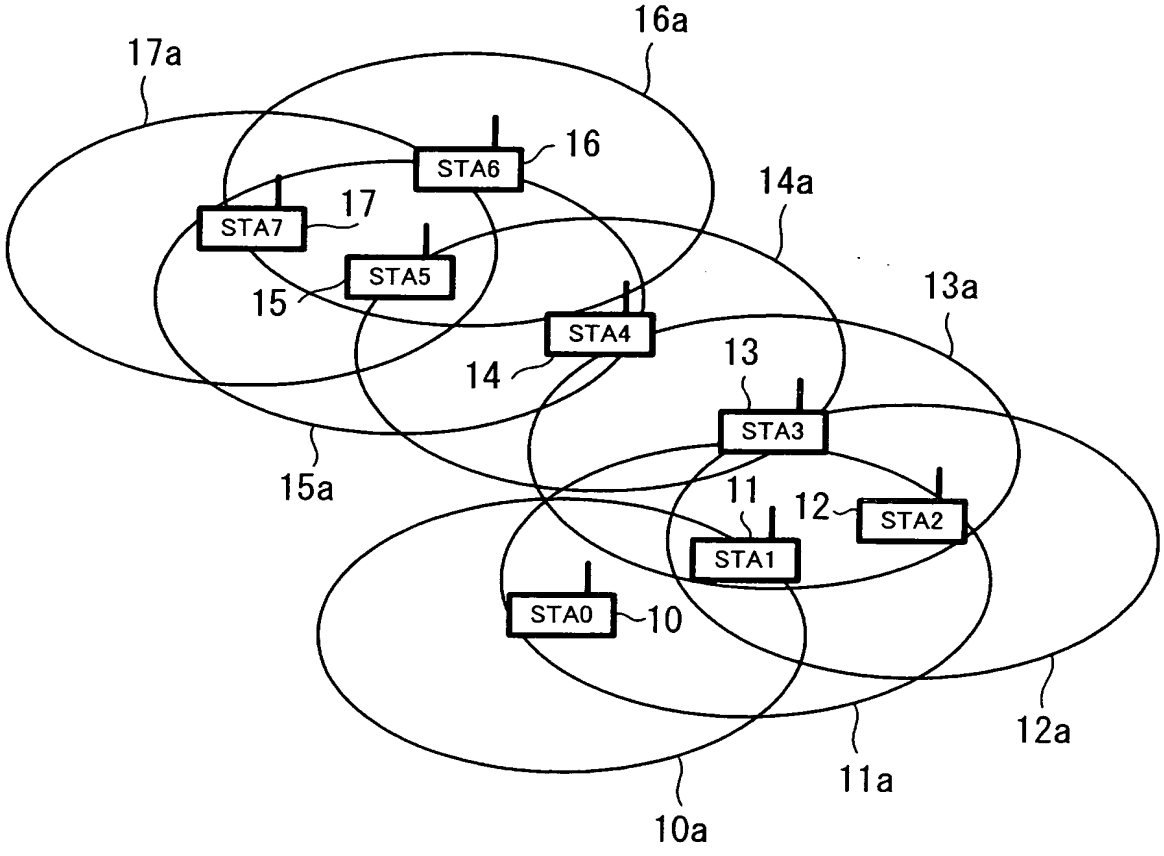
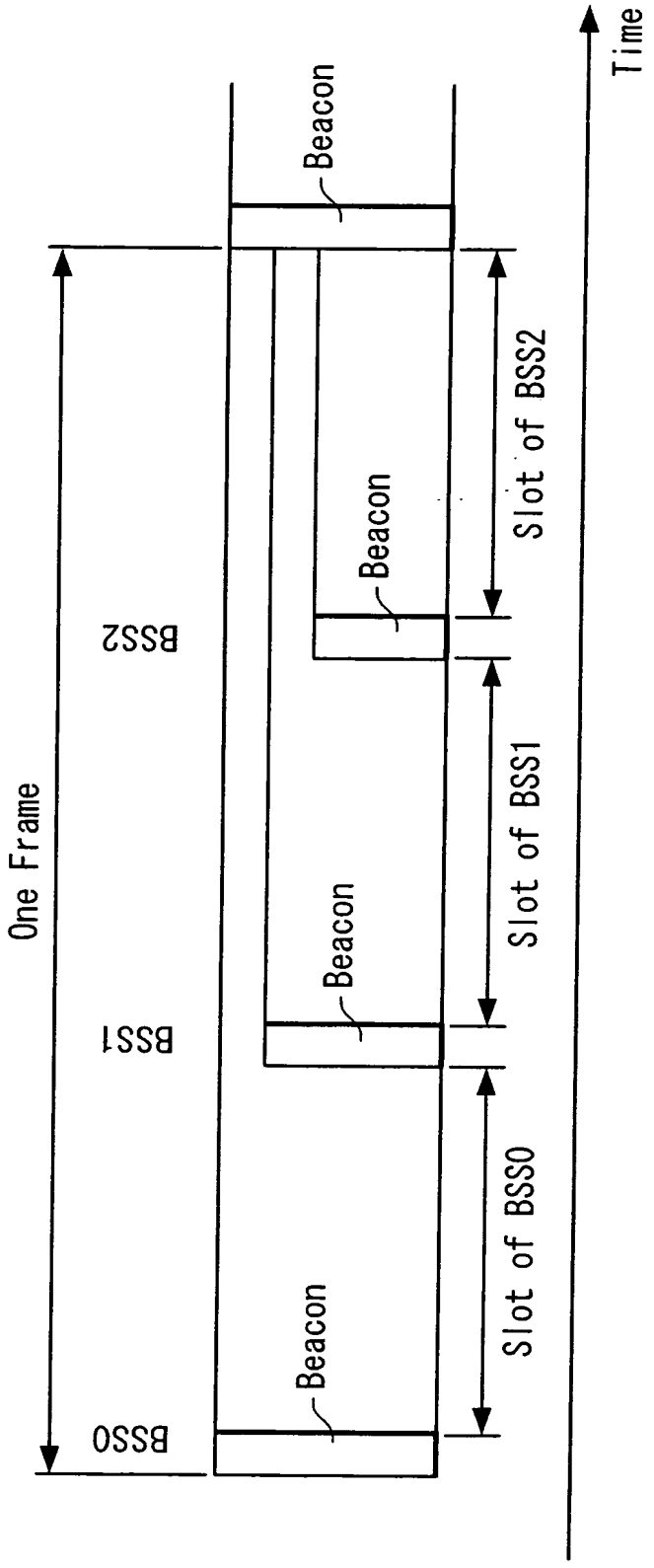

16a
17a
16
STA6
14a
17
STA7
STA5
15
13a
STA4
14
13
STA3
15a
11
12
STA2
STA1
STA0
10
12a
11a
10a

FIG. 38


Time
Beacon
Beacon
Beacon
Beacon
BSS2
BSS1
BSS0
One Frame
Slot of BSS2
Slot of BSS1
Slot of BSS0

OTS RECD PCT/PTO 30 JUN 2004

DESCRIPTION OF REFERENCE NUMERALS

10, 11, 12, 13 ... communication stations

10a, 11a, 12a, 13a ... communication ranges of communication stations

80 ... register

81 to 92 ... adders

93 ... register

100 ... wireless communication apparatus

101 ... interface

102 ... data buffer

103 ... central control unit

104 ... beacon generating unit

106 ... wireless transmitting unit

107 ... timing control unit

109 ... antenna

110 ... wireless receiving unit

112 ... beacon analyzing unit

113 ... information storage unit